



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,669	09/27/2001	Gene L. Cangiani	0918.0028C	8966
27896	7590	11/22/2005	EXAMINER	
EDEL, SHAPIRO & FINNAN, LLC 1901 RESEARCH BOULEVARD SUITE 400 ROCKVILLE, MD 20850			CHANG, EDITH M	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. (X)	Applicant(s)	
	09/963,669	CANGIANI ET AL.	
	Examiner	Art Unit	
	Edith M. Chang	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-23, 26-39, 42-45 is/are rejected.
- 7) ☒ Claim(s) 10, 24, 25, 40 and 41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on September 6, 2005, with respect to independent claims 1, 15, and 31, have been fully considered but they are not persuasive.

2. Applicant's arguments, see pages 13-14, filed on September 6, 2005, with respect to claims 10, 24-25 and 40-41 have been fully considered and are persuasive. The rejection of claims 10, 24-25 and 40-41 has been withdrawn.

Argument: Applicants argue that the prior art reference Spilker teaches the well know technique Majority voting for combining signals to form a constant-envelope composite signal and the prior art reference Butman et al. teaches the well known technique interplex modulation for combining signals to form a constant-envelope composite signal, however, there is no suggestion to employ a combination of these two techniques and no combination of Spilker and Butman would have rendered obvious the claimed combination of majority voting and interplex modulation.

Response: Reference Butman (IEEE Transactions on Comm., June 1972) teaches the new efficient phase-shift-keyed/phase-modulated (PSK/PN) multichannel system in Fig.2 (page 417, Butman), called interplex, which has less cross-modulation loss than conventional PSK/PM (Introduction, page 415) - the benefit/motivation and the problem to be solved of using the new efficient PSK/PM in multichannel system.

Reference Spilker (US Patent 6,044,071) discloses the majority vote logic for GPS multichannel system in FIG.9 ('071), wherein the feature of the composite code of

Art Unit: 2637

the majority vote combiner is to optimize the cross-correlation with each inputs to the majority vote combiner (column 5, lines 58-64 '071) - the problem needed to be solved; and the BPSK modulator to modulate the composite code from the majority vote logic.

As Spilker using the constant envelope digital phase modulation (PSK/PM. column 2 lines 48-54 '071) in the GPS satellite (multichannel) system, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the Spilker et al.'s BPSK Modulator with the interplexing feature taught by Butman et al. in Fig.2 to reduce the cross-modulation loss for improving the performance of multichannel system (Abstract, IEEE).

There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art (MPEP 2143.01[R-2]). Hence, the obvious combination is proper.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9, 11-23, 26-39, 42-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spilker, Jr. (US 6.044,071) in view of Butman et al. ("Interplex-An

Efficient Multichannel PSK/PM Telemetry System" IEEE Transactions on Communication).

Regarding **claims 1, 8, 15, 22, 31 & 38**, in FIG.9, Spilker, Jr. teaches an implementation for Majority-Combined Composite Code and its method in the GPS system, wherein five signals (C/A clock, Existing C/A code, P clock, Existing P/Y code and new M PN code) are input to the Majority Vote Logic, three of the five signals are majority-logic combined (M, C/A and P/Y are combined, column 5 lines 27-30 & column 6 lines 22-24) to obtain a majority vote signal (the constant-envelope composite signal) inputted to a BPSK Modulator and to a Power Amplifier. When the jamming presents (a desired power distribution changes), the M code is provided to Majority Vote Logic to let the system operable under jamming (column 3 lines 42-45 & column 3 lines 15-18). However Spilker does not explicitly name the interplex modulation, Butman et al. teaches the phase-shift-keyed/phase-modulated (PSK/PM) multichannel system called Interplex in Fig.2 (Abstract). As Spilker, Jr. using the constant envelope digital phase modulation (column 2 lines 48-54) in the GPS satellite system, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the Spilker et al.'s BPSK Modulator with the interplexing feature taught by Butman et al. in Fig.2 to reduce the cross-modulation loss for improving the performance of multichannel system (Abstract).

Regarding **claims 2-6, 16-20, 32-36 & 42**, Spilker, Jr.' system modified with Butman et al.'s teaching teaches the majority vote logic/combiner taking three pulse trains: the C/A code, the P code, and the M code (column 5 lines 52-54), outputting a

Art Unit: 2637

combined pulse train with 1 whenever two or more of the three composed signals is one and -1 whenever two or more of the three composed signals is -1 (column 5 lines 55-57 '071), wherein the combined pulse train interlacing values of the composed signals to the majority vote based to the majority vote algorithm defined (in column 5 lines 52-54), and Mod 2 Adder with data to one of the inputs d_i of the BPSK Modulator (the interplexer, d_1 or d_2 of Fig.1, Butman). The Spilker, Jr.' system modified with Butman et al.'s teaching has the structure and performs the subject matter recited in the claims.

Regarding **claims 7, 21 & 37**, in FIG.9, Spilker, Jr.' teaches chip synchronous pseudo-noise codes (column 5 lines 52-54).

Regarding **claims 9, 23 & 39**, in FIG.9, Spilker, Jr. teaches the multiplexing loss from combining three signals is substantially the same for each of the five signals.

Regarding **claims 11 & 26**, The Spilker, Jr.' system modified with Butman et al.'s teaching the BPSK Modulator comprising multiple phase modulators 0 (Fig. 1 of Butman); multiple attenuators NV and a combiner to combine the in-phase and quadrature components of channels.

Regarding **claims 12, 27 & 43**, in FIG.9, Spilker, Jr. teaches the BPSK (QPSK, column 2 lines 46-54).

Regarding **claims 13-14, 28-30 & 44-45**, in FIG.1, Spilker, Jr. teaches GPS, CDMA (column 1 lines 55-67) and remotely programmable implementation.

Allowable Subject Matter

5. Claims 10, 24-25 and 40-41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest, alone or in a combination, among other things, at least an apparatus and its method for combining a plurality of signals to form a constant-envelope composite signal for transmission as a whole, the combination of elements and features, which includes a majority voting logic unit to combine a subset of five signals by majority vote to tree of the five signals to form a majority voted signal; and interplex modulating the majority voted signal and the others of the five signals to form the constant-envelope composite signal.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

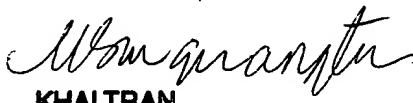
extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M. Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay K. Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang
November 17, 2005


KHAI TRAN
PRIMARY EXAMINER